Table of Contents

1. OVERALL MACHINE INFORMATION

1. SPECIFICATIONS 1-1

2. COPY PROCESSES AROUND THE DRUM 1-4

3. COPY PROCESS CONTROL. 1-6

4. MECHANICAL COMPONENT LAYOUT 1-7

5. DRIVE LAYOUT 1-8

6. ELECTRICAL COMPONENT DESCRIPTIONS. 1-9

7. MAJOR DIFFERENCES BETWEEN THE A110 AND A173 MODELS. 1-12

2. DETAILED SECTION DESCRIPTIONS

1. DRUM 2-1

1.1 OPC DRUM CHARACTERISTICS 2-1

1.2 DRUM UNIT 2-2

2. DRUM CHARGE 2-3

2.1 OVERVIEW. 2-3

2.2 CHARGE CORONA WIRE CLEANER MECHANISM 2-4

2.3 CHARGE CORONA CIRCUIT 2-5

2.4 GRID VOLTAGE CORRECTION (VR CORRECTION) 2-6

2.5 GRID VOLTAGE CONTROL 2-7

2.5.1 Image Density Control. 2-7

2.5.2 Vr Detection 2-7

2.5.3 Toner Density Detection 2-7

3. OPTICS 2-8

3.1 OVERVIEW. 2-8

3.2 SCANNER DRIVE 2-9

3.3 LENS DRIVE. 2-10

3.3.1 Lens Drive 2-10

3.3.2 Lens Positioning 2-11
3.4 4TH AND 5TH MIRROR DRIVE 2-12
3.4.1 Drive 2-12
3.4.2 Positioning 2-12
3.5 AUTOMATIC IMAGE DENSITY DETECTION 2-13
3.6 EXPOSURE LAMP VOLTAGE CORRECTION 2-14
3.6.1 VL Correction 2-14
3.6.2 Reproduction Ratio Correction 2-14
3.7 EXPOSURE LAMP VOLTAGE CONTROL 2-15
3.7.1 Base Lamp Voltage 2-15
3.7.2 Image Density Setting Factor (Manual ID Mode Only) 2-15
3.7.3 VL Correction Factor 2-16
3.7.4 Reproduction Ratio Correction Factor 2-16
3.8 EXPOSURE LAMP CONTROL 2-17
4. ERASE 2-18
4.1 OVERVIEW 2-18
4.1.1 Lead Edge Erase 2-19
4.1.2 Side Erase 2-19
4.1.3 Trail Edge Erase 2-20
4.1.4 Editing Mode Erase 2-20
4.1.5 Erase During Detection Cycles 2-21
5. DEVELOPMENT 2-22
5.1 OVERVIEW 2-22
5.2 CROSS-MIXING 2-23
5.3 DEVELOPMENT BIAS FOR IMAGE DENSITY CONTROL 2-24
5.3.1 Base Bias Voltage Factor in Manual Image Density Control 2-24
5.3.2 Base Bias Voltage Factor in Automatic Image Density Control 2-25
5.3.3 Base Bias Voltage Adjustment Factor 2-26
5.3.4 Vr Correction Factor 2-26
5.4 TONER SAVER MODE 2-27
5.5 DEVELOPMENT BIAS CIRCUIT 2-28

3. INSTALLATION

1. INSTALLATION REQUIREMENTS 3-1

1.1 ENVIRONMENT 3-1

1.2 MACHINE LEVEL 3-1

1.3 MINIMUM SPACE REQUIREMENTS 3-2

1.4 POWER REQUIREMENTS 3-2

2. INSTALLATION PROCEDURE 3-3

2.1 ACCESSORY CHECK 3-3

2.2 COPIER INSTALLATION 3-4

2.3 CASSETTE MODIFICATION 3-10

2.4 KEY COUNTER HOLDER INSTALLATION (Option) 3-11

2.5 TONER OVERFLOW SENSOR INSTALLATION (Option) 3-12

2.6 PRE-TRANSFER LAMP (PTL) INSTALLATION (Option) 3-13

2.7 OPTICS ANTI-CONDENSATION HEATER INSTALLATION (Option) 3-14

4. SERVICE TABLES

1. SERVICE REMARKS 4-1

1.1 GENERAL CAUTION 4-1

1.2 DRUM AND DRUM UNIT 4-1

1.3 CHARGE CORONA 4-2

1.4 OPTICS 4-2

1.5 DEVELOPMENT UNIT 4-3

1.6 TONER SUPPLY 4-4

1.7 TRANSFER AND SEPARATION 4-4

1.8 CLEANING UNIT 4-4

1.9 FUSING UNIT 4-5

1.10 PAPER FEED 4-5

1.11 DOCUMENT FEEDER 4-5

1.12 SORTER 4-5

1.13 OTHERS 4-6

2. SERVICE PROGRAM MODE 4-7

2.1 SERVICE PROGRAM MODE OPERATION 4-7

2.1.1 Service Program Access Procedure 4-7

2.1.2 Change Adjustment Values or Modes. 4-9

2.1.3 Memory Reset Procedures 4-9

2.2 SERVICE PROGRAM MODE TABLE 4-12

2.3 SP-8 SENSOR/SWITCH DATA CHECK 4-24

2.4 SP-9 ELECTRICAL COMPONENT CHECK. 4-25

2.5 MISFEED LOCATION INDICATOR 4-26

2.5.1 Misfeed Indication 4-26

2.5.2 Misfeed Recovery 4-27

3. SERVICE TABLES 4-28

3.1 DIP SWITCHES 4-28

3.2 VARIABLE RESISTORS. 4-29

4. SPECIAL TOOLS AND LUBRICANTS 4-30

5. PREVENTIVE MAINTENANCE SCHEDULE 4-31

5.1 PM TABLE 4-31

5.2 EXPLANATION OF REGULAR PM 4-33

5.3 REGULAR PM PROCEDURE 4-35

5. REPLACEMENT AND ADJUSTMENT

1. EXTERIOR AND INNER COVERS. 5-1

1.1 EXTERIOR COVER REMOVAL 5-1

1.1.1 Front Door 5-1

1.1.2 Inner Cover 5-2

1.1.3 Right Cover 5-3

1.1.4 Rear Cover 5-3

1.1.5 Left Covers 5-3

1.1.6 Upper Cover 5-3

1.1.7 Operation Panel 5-3

2. OPTICS 5-4

2.1 EXPOSURE GLASS REMOVAL 5-4

2.2 1ST MIRROR REMOVAL 5-5

2.3 2ND AND 3RD MIRROR REMOVAL 5-7

2.4 4TH AND 5TH MIRROR REPLACEMENT 5-9

2.5 EXPOSURE LAMP REPLACEMENT 5-10

2.6 OPTICS THERMOFUSE REMOVAL 5-12

2.7 SCANNER DRIVE WIRE REPLACEMENT 5-13

2.7.1 Wire Removal 5-13

2.7.2 Wire Installation 5-14

2.8 SCANNER MOTOR REPLACEMENT 5-20

2.9 LENS MOTOR REPLACEMENT 5-21

2.10 LENS DRIVE WIRE INSTALLATION 5-22

2.11 4TH/5TH MIRROR MOTOR REPLACEMENT 5-23

3. DEVELOPMENT AND TONER SUPPLY 5-24

3.1 TONER SUPPLY UNIT REMOVAL 5-24

3.2 DEVELOPER REPLACEMENT 5-25

3.3 INLET SEAL REMOVAL 5-26

3.4 TONER SUPPLY CLUTCH REPLACEMENT 5-27

3.5 CLUTCH REMOVAL 5-28

3.5.1 1st Paper Feed Clutch 5-28

3.5.2 2nd Paper Feed Clutch 5-28

3.5.3 Relay Roller Clutch/Registration Clutch 5-28

3.6 DEVELOPMENT BIAS VOLTAGE ADJUSTMENT (SP9-57) 5-29

4. CLEANING 5-30

4.1 CLEANING UNIT REMOVAL 5-30

4.2 CLEANING BLADE REPLACEMENT 5-31

4.3 USED TONER COLLECTION 5-32

4.4 ENTRANCE SEAL REPLACEMENT 5-33

5. PAPER FEED 5-34

5.1 1ST PAPER SIZE SWITCH REPLACEMENT 5-34

5.2 1ST PAPER END SENSOR REPLACEMENT 5-35
5.3 PAPER FEED ROLLER REPLACEMENT 5-36
5.4 FRICTION PAD REPLACEMENT. 5-37
5.5 2ND PAPER FEED ROLLER REPLACEMENT 5-38
5.6 2ND PAPER END SENSOR REPLACEMENT. 5-39
5.7 REGISTRATION SENSOR/REGISTRATION ROLLER REMOVAL. 5-40
5.8 1ST PAPER FEED PRESSURE ADJUSTMENT 5-44
6. AROUND THE DRUM. 5-45
6.1 DRUM REPLACEMENT 5-45
6.2 ID SENSOR REPLACEMENT 5-48
6.3 PICK-OFF PAWL REPLACEMENT 5-49
6.4 QUENCHING LAMP REMOVAL. 5-50
6.5 ERASE LAMP REMOVAL 5-51
6.6 CHARGE CORONA WIRE REPLACEMENT 5-52
6.7 CHARGE CORONA GRID REPLACEMENT 5-53
6.8 TRANSFER/SEPARATION CORONA WIRE REPLACEMENT. 5-54
6.9 CORONA CURRENT ADJUSTMENT 5-55
6.9.1 CHARGE CORONA CURRENT ADJUSTMENT (SP9-2). 5-57
6.9.2 GRID VOLTAGE ADJUSTMENT (SP9-2) 5-59
6.9.3 TRANSFER CORONA CURRENT ADJUSTMENT (SP9-5). 5-60
6.9.4 SEPARATION CORONA CURRENT ADJUSTMENT (SP9-8). 5-61
7. FUSING 5-62
7.1 EXIT UNIT REMOVAL 5-62
7.2 FUSING LAMP REPLACEMENT 5-63
7.3 PRESSURE ROLLER REPLACEMENT. 5-64
7.4 HOT ROLLER REPLACEMENT 5-66
7.5 FUSING THERMISTOR AND THERMOFUSE. 5-68
7.6 FUSING PRESSURE ADJUSTMENT 5-69
7.7 EXHAUST BLOWER MOTORS/EXIT SENSOR REPLACEMENT 5-70
8. OTHERS 5-71
8.1 OZONE FILTER REPLACEMENT 5-71

9. COPY QUALITY ADJUSTMENT 5-72

9.1 LIGHT INTENSITY ADJUSTMENT 5-73
9.2 UNEVEN EXPOSURE ADJUSTMENT. 5-74
9.3 BIAS VOLTAGE ADJUSTMENT. 5-75
9.4 TONER DENSITY ADJUSTMENT 5-76
9.5 FIXED TONER SUPPLY MODE SELECTION 5-76
9.6 TONER SUPPLY RATIO SELECTION. 5-76
9.7 VERTICAL MAGNIFICATION ADJUSTMENT 5-77
9.8 HORIZONTAL MAGNIFICATION ADJUSTMENT 5-77
9.9 FOCUS ADJUSTMENT 5-78
9.10 LEADING EDGE ERASE MARGIN ADJUSTMENT 5-79
9.11 REGISTRATION ADJUSTMENT 5-79
9.12 SIDE-TO-SIDE REGISTRATION ADJUSTMENT 5-80
9.13 4TH/5TH MIRROR HEIGHT ADJUSTMENT 5-82

6. TROUBLESHOOTING

1. COPY QUALITY 6-1

1.1 BLANK COPY (WHITE COPY). 6-1
1.2 DIRTY BACKGROUND 6-4
1.3 UNEVEN IMAGE DENSITY 6-7
1.4 VERTICAL BLACK BANDS 6-8
1.5 VERTICAL BLACK LINES 6-9
1.6 VERTICAL WHITE LINES OR BANDS–1 (DULL OR BLURRED) 6-10
1.7 VERTICAL WHITE LINES OR BANDS–2 (THIN, DISTINCT) 6-11
1.8 HORIZONTAL BLACK/WHITE LINES 6-12
1.9 JITTER 6-13
1.10 BLACK SPOTS ON THE COPY IMAGE 6-14
1.11 SKEWED (OPTICAL) COPY IMAGE 6-15
1.12 TONER DENSITY TOO HIGH 6-16
1.13 TONER DENSITY TOO LOW. 6-18
1.14 TONER SCATTERING 6-20

1.15 UNFUSED COPY IMAGE. 6-21
1.16 PAPER MISFEED. 6-22
1.17 DF ORIGINAL MISFEED OR SKEW 6-23
2. U-CODE CONDITIONS. 6-24
2.1 U1 - RIGHT COVER OPEN 6-24
2.2 U2 - KEY COUNTER NOT SET 6-24
2.3 U4 - SORTER OPEN 6-24
2.4 U6 - DRUM PROTECTION SHEET REMAINING 6-24
3. SERVICE CALL CONDITIONS 6-25
3.1 CODE #11 – EXPOSURE LAMP ERROR 6-25
3.2 CODE #12 – EXPOSURE LAMP ERROR 6-25
3.3 CODE #13 – ZERO CROSS SIGNAL ERROR 6-26
3.4 CODE #21 – SCANNER HOME POSITION ERROR. 6-26
3.5 CODE #22 – SCANNER HOME POSITION ERROR. 6-26
3.6 CODE #28 – LENS HOME POSITION ERROR 6-27
3.7 CODE #29 – LENS HOME POSITION ERROR 6-27
3.8 CODE #2A – 4TH/5TH MIRROR HOME POSITION ERROR 6-27
3.9 CODE #2B – 4TH/5TH MIRROR HOME POSITION ERROR 6-28
3.10 CODE #52 – FUSING LAMP WARM-UP ERROR 6-28
3.11 CODE #53 – FUSING LAMP OVERHEAT 6-28
3.12 CODE #55 – FUSING THERMISTOR OPEN. 6-29
3.13 E70 (IN THE MAGNIFICATION INDICATOR) – TONER OVERFLOW 6-29
4. ELECTRICAL COMPONENT DEFECTS 6-30
4.1 SENSORS 6-30
4.2 SWITCHES AND OTHER ELECTRICAL COMPONENTS. 6-31
4.3 BLOWN FUSE CONDITION. 6-32

DOCUMENT FEEDER

1. SPECIFICATIONS 1
2. COMPONENT LAYOUT 2

3. ELECTRICAL COMPONENT DESCRIPTIONS 3

4. OVERALL MACHINE CONTROL. 4

5. BASIC OPERATION 6

6. ORIGINAL FEED 8

6.1 ORIGINAL PICK-UP 8

6.2 ORIGINAL SEPARATION. 9

6.3 ORIGINAL FEED-IN MECHANISM 10

6.4 ORIGINAL SIZE DETECTION 12

6.5 ORIGINAL INVERSION MECHANISM. 13

6.6 ORIGINAL FEED-OUT MECHANISM 15

6.7 BELT DRIVE MOTOR CIRCUIT. 16

6.8 FEED-OUT MOTOR CIRCUIT 17

6.9 INPUT AND OUTPUT CIRCUITS. 18

7. LIFT MECHANISM 19

8. ORIGINAL MISFEED DETECTION 20

9. INSTALLATION PROCEDURE 22

9.1 ACCESSORY CHECK 22

9.2 INSTALLATION PROCEDURE 25

10. PREPARATION FOR TRANSPORTATION. 31

11. REPLACEMENT AND ADJUSTMENT 32

11.1 FEED-IN UNIT 32

11.1.1 Transport Belt Replacement 32

11.1.2 Feed-in Unit Removal 34

11.1.3 Pick-up Roller Replacement 35

11.1.4 Feed-in Clutch Lubrication 36

11.1.5 Pick-up Solenoid Adjustment 37

11.1.6 Feed Roller Replacement 39

11.1.7 Feed-in Solenoid Adjustment 40

11.1.8 Friction Belt Replacement. 41

11.2 FEED-OUT UNIT 42

11.2.1 Feed-out Unit Removal 42
11.2.2 Inverter Solenoid Adjustment 43
11.2.3 DF Leading Edge Registration Adjustment 44
11.3 BELT DRIVE MOTOR SPEED ADJUSTMENT 45

SORTER

1. SPECIFICATIONS 1
2. COMPONENT LAYOUT 2
3. ELECTRICAL COMPONENT DESCRIPTIONS 3
4. OVERALL MACHINE CONTROL 4
5. BASIC OPERATION 5
6. EXIT ROLLER DRIVE 6
6.1 ROLLER DRIVE MECHANISM 6
6.2 ROLLER DRIVE CIRCUIT 7
7. BIN DRIVE 8
7.1 BIN DRIVE MECHANISM 8
7.2 BIN DRIVE CIRCUIT 10
8. MISFEED DETECTION 11
9. INSTALLATION PROCEDURE 12
9.1 ACCESSORY CHECK 12
9.2 INSTALLATION PROCEDURE 13
10. PREPARATION FOR TRANSPORTATION 16
11. ROLLER DRIVE BELT REPLACEMENT 17
12. BIN GUIDE LUBRICATION 18